Medical Informatics Europe 2003
St-Malo, France
May 6, 2003 - Workshop W20

Issues and perspectives for medical text indexing

Olivier Bodenreider

Lister Hill National Center
for Biomedical Communications
Bethesda, Maryland - USA

The Indexing Initiative

Motivation at NLM

- Increasing volume of biomedical literature
  - MEDLINE has grown from about 7 million citations in 1996 to over 12 million now
  - The number of journals indexed has grown from about 3,750 in 1996 to 4,600 now
- Increasing availability of full text
- Limited resources
  - Especially qualified indexers

The IND Project

[Aronson & al., *AMIA*, 2000]

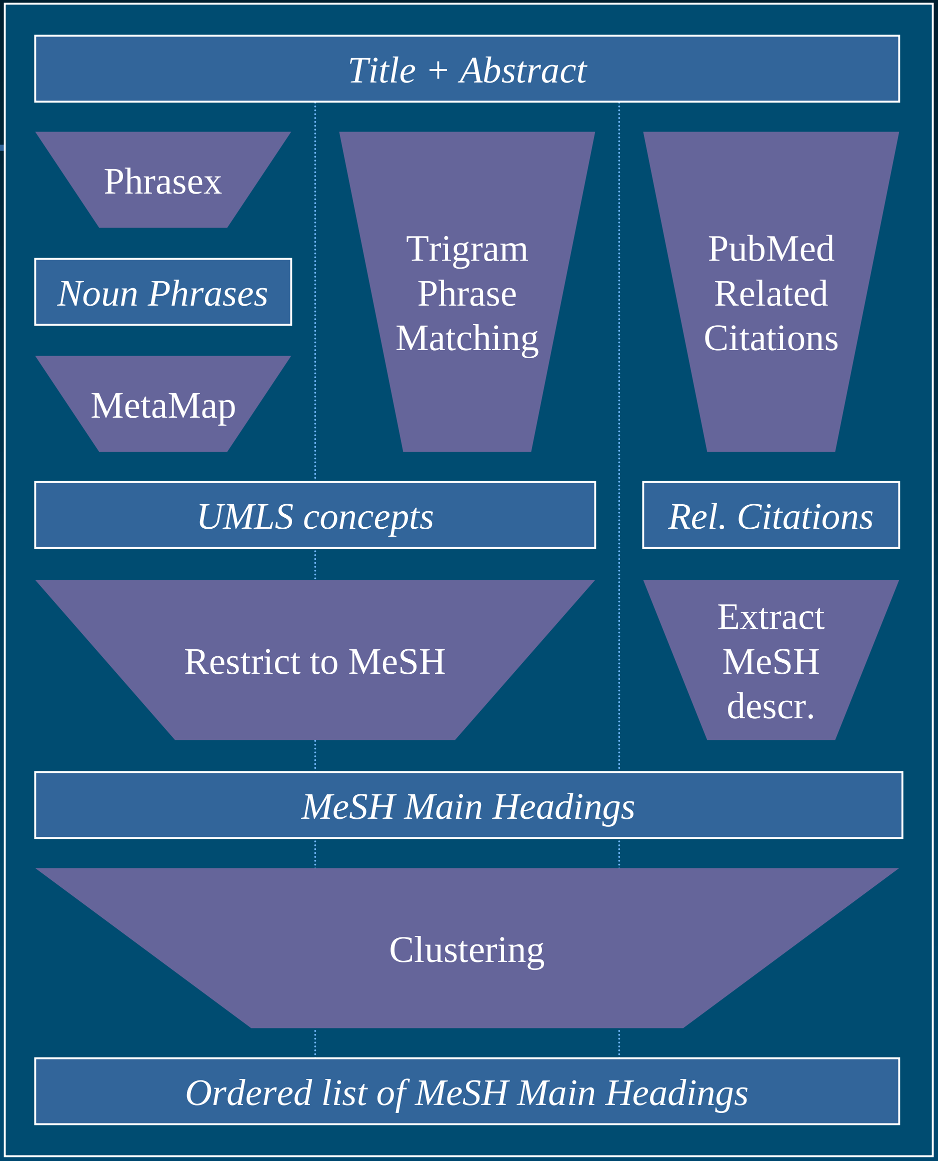
- Objectives
  - Investigate automatic and semiautomatic indexing methods
  - Producing equal or better retrieval
- Initially, an independent collection of projects addressing
  - Indexing methods
  - Evaluation
  - Policy

http://ii.nlm.nih.gov

Current status

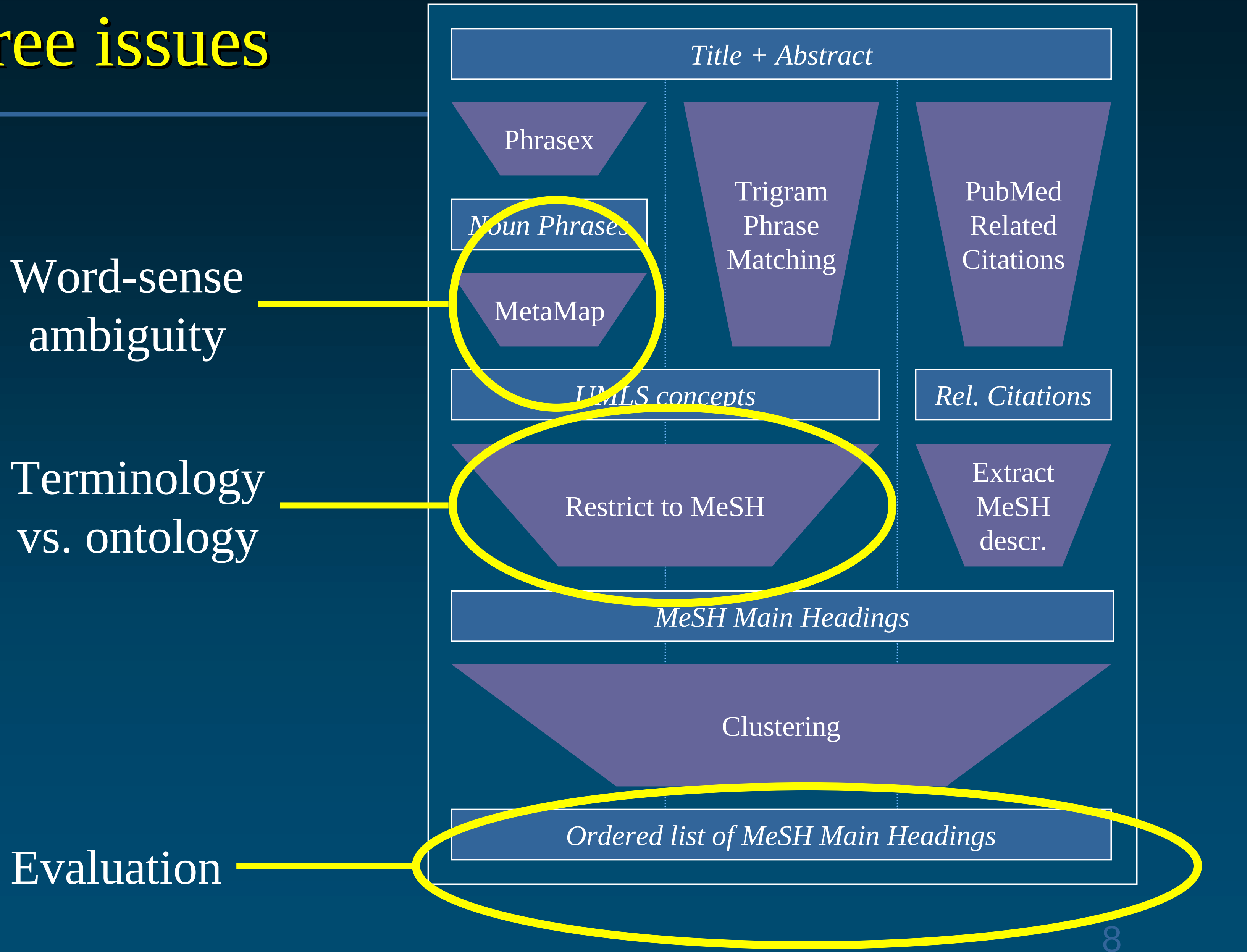
- Semi-automatic indexing
  - New citations are indexed every night
  - Suggested descriptors integrated in the environment used by the indexers
  - Ongoing evaluation
- Automatic indexing
  - Collections not otherwise indexed
  - Descriptors not displayed

Overview


Title + Abstract
Phrasex
Noun Phrases
MetaMap
Trigram Phrase Matching
PubMed Related Citations
UMLS concepts
Rel. Citations
Restrict to MeSH
Extract MeSH descr.
MeSH Main Headings
Clustering
Ordered list of MeSH Main Headings

Three issues

Three issues



Word sense ambiguity

- Inherent to natural language processing (NLP)
- Active research field
- Compounded in the biomedical domain
  - Acronyms / abbreviations
  - Gene / gene product names
  - Terms not fully specified

Terminology vs. ontology

- Hierarchies often task-driven rather than based on principles
- Usually suitable for information retrieval
  - Better recall
  - Precision may not be crucial
- Not necessarily suitable for reasoning

NLM

Evaluation

- Index-based
  - Gold standard
    - But no ground truth
  - Similarity measures
    - But multiple perspectives possible
- Retrieval-based
  - Requires test collections

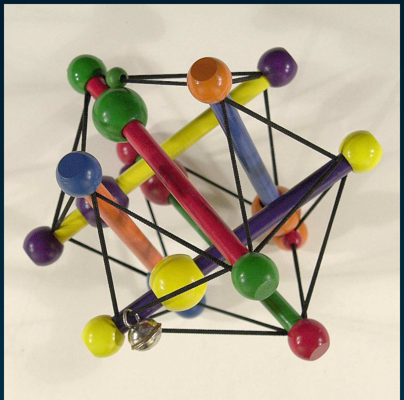
- System-vs. user-centered

Perspectives

Perspectives

- Requirements
  - Better ontologies
  - Better identification of specialized entities (e.g., gene names)
  - Better word-sense disambiguation techniques
- Tremendous interest (through data mining and knowledge discovery)
  - In the medical informatics community
  - And beyond (KDD cup 02, genomic track at TREC 03)

NLM



Medical Ontology Research

Contact: olivier@nlm.nih.gov

Web: etbsun2.nlm.nih.gov:8000

NATIONAL
LIBRARY OF
MEDICINE

Olivier Bodenreider

Lister Hill National Center
for Biomedical Communications
Bethesda, Maryland - USA